

AMENDMENTS TO THE CLAIMS

1. (currently amended) An aqueous sizing composition comprising the product of combining:

(a) an emulsion comprising alkenylsuccinic anhydride component containing alkenylsuccinic anhydride particles suspended in an aqueous polymer solution, wherein the aqueous polymer solution consists of comprising water and a polymer selected from the group consisting of vinyl addition and condensation polymers having anionic, non-ionic, or amphoteric charge characteristics with a charge substitution range varying from 0 to about 90%, and wherein the alkenyl succinic anhydride component comprises a surfactant component selected from the group consisting of sulfosuccinates, alkyl and aryl amides and primary, secondary and tertiary amines and their corresponding quaternary salts, fatty acids, ethoxylated fatty acids, fatty alcohols, ethoxylated fatty alcohols, fatty esters, ethoxylated fatty esters, ethoxylated triglycerides, ethoxylated lanolin, sulfonated amines, sulfonated amides, ethoxylated polymers, propoxylated polymers, ethoxylated/propoxylated copolymers, polyethylene glycols, phosphate esters, phosphonated fatty acid ethoxylates, phosphonated fatty alcohol ethoxylates, alkyl sulfonates, aryl sulfonates, alkyl sulfates, alkylsulfates, and combinations thereof, and

(b) a second component selected from the group consisting of cationic starches, non-ionic starches, anionic starches, water-soluble polymer, water, and mixtures thereof,

wherein the alkenylsuccinic anhydride component is sufficiently dilute to enable the sizing composition to impart useful sizing properties to a fibrous substrate when the sizing composition contacts the fibrous substrate.

2. (previously presented) The process of claim 1, wherein the polymer of the aqueous polymer solution is selected from the group consisting of vinyl addition polymers, condensation polymers, and combinations thereof.

3. (original) The process of claim 1, wherein the water-soluble polymer is present in the emulsion at an alkenylsuccinic anhydride:water-soluble polymer weight ratio range of 1:0.05 to about 1:1.

4. (original) The process of claim 1 wherein the alkenyl succinic anhydride component in the aqueous sizing composition is present at an amount ranging from about 0.001 to 5 wt %.

5. (currently amended) The sizing composition of claim 1, wherein the composition contains a surfactant component ~~is an~~ selected from the group consisting of sulfosuccinates, alkyl and aryl amides and primary, secondary and tertiary amines and their corresponding quaternary salts, fatty acids, ethoxylated fatty acids, fatty alcohols, ethoxylated fatty alcohols~~alcohol~~, fatty esters, ethoxylated fatty esters, ethoxylated triglycerides, certain ethoxylated lanolin, sulfonated amines, sulfonated amides, ethoxylated polymers, propoxylated polymers, ethoxylated/propoxylated copolymers, polyethylene glycols, phosphate esters, phosphonated fatty acid ethoxylates, phosphonated fatty alcohol ethoxylates, alkyl sulfonates, aryl sulfonates, alkyl sulfates, alkylsulfates, and combinations thereof.

6. (previously presented) The sizing composition of claim 5, wherein the surfactant component is present at a level ranging from about 0.1 weight % up to about 20 weight %, based on alkenylsuccinic anhydride.

7. (original) The sizing composition of claim 1, wherein the alkenyl succinic anhydride particles have a median particle size ranging from about 0.5 to about 20 microns.

8. (original) The sizing composition of claim 1, wherein the alkenylsuccinic anhydride component further comprises hydrolyzed alkenylsuccinic anhydride in an amount ranging from about 1 to about 99%, based on the total weight of the alkenylsuccinic anhydride.

9. (original) The sizing composition of claim 1, wherein the sizing composition is of sufficient dilution so that when the sizing composition treats a fibrous substrate, the treated fibrous substrate has a Cobb sizing of less than about 150 gsm for 30 minutes or about 100 gsm for two minutes.

10. (original) The sizing composition of claim 1, wherein the sizing composition is of sufficient dilution so that if the sizing composition treats a fibrous substrate, the treated fibrous substrate retards ink penetration, giving an HST value of at least ten seconds.

11. (original) The sizing composition of claim 1, wherein the sizing composition is of sufficient dilution to minimize the sizing composition from coalescing at a temperature ranging from about 40 to about 185° F.

12. (original) The sizing composition of claim 1, wherein the alkenyl succinic anhydride particles have a monomodal particle distribution.

13. (original) The sizing composition of claim 1, wherein the alkenyl succinic anhydride particles have a bimodal or a multimodal particle distribution.

14-45. (canceled)

46. (currently amended) An aqueous sizing composition comprising the product of combining:

(a) a heated first component, that is an emulsion comprising alkenylsuccinic anhydride component containing alkenylsuccinic anhydride particles suspended in an aqueous polymer solution, wherein the aqueous polymer solution consists of comprising water and a polymer selected from the group consisting of vinyl addition and condensation polymers having anionic, non-ionic, or amphoteric charge characteristics with a charge substitution range varying from 0 to about 90%, and wherein the alkenyl succinic anhydride component comprises a surfactant component selected from the group consisting of sulfosuccinates, alkyl and aryl amides and primary, secondary and tertiary

amines and their corresponding quaternary salts, fatty acids, ethoxylated fatty acids, fatty alcohols, ethoxylated fatty alcohols, fatty esters, ethoxylated fatty esters, ethoxylated triglycerides, ethoxylated lanolin, sulfonated amines, sulfonated amides, ethoxylated polymers, propoxylated polymers, ethoxylated/propoxylated copolymers, polyethylene glycols, phosphate esters, phosphonated fatty acid ethoxylates, phosphonated fatty alcohol ethoxylates, alkyl sulfonates, aryl sulfonates, alkyl sulfates, alkylsulfates, and combinations thereof; and

(b) a second component selected from the group consisting of cationic starches, non-ionic starches, anionic starches, water, water-soluble polymers, and mixtures thereof;

wherein the alkenylsuccinic anhydride component and the second component are sufficiently diluted to enable the sizing composition to impart useful sizing properties to a fibrous substrate when the sizing composition contacts the fibrous substrate, and wherein the sizing composition has a temperature that is more than about 4° C.

47. (currently amended) An aqueous sizing composition comprising the product of combining:

(a) an emulsion comprising alkylene ketene dimer component containing alkylene ketene dimer particles suspended in an aqueous polymer solution, wherein the aqueous polymer solution consists of comprising water and a polymer selected from the group consisting of vinyl addition and condensation polymers having anionic, non-ionic, or amphoteric charge characteristics with a charge substitution range varying from 0 to about 90%, and wherein the alkylene ketene dimer component comprises a surfactant component selected from the group consisting of sulfosuccinates, alkyl and aryl amides and primary, secondary and tertiary amines and their corresponding quaternary salts, fatty acids, ethoxylated fatty acids, fatty alcohols, ethoxylated fatty alcohols, fatty esters, ethoxylated fatty esters, ethoxylated triglycerides, ethoxylated lanolin, sulfonated amines, sulfonated amides, ethoxylated polymers, propoxylated polymers, ethoxylated/propoxylated copolymers, polyethylene glycols, phosphate esters, phosphonated fatty acid ethoxylates, phosphonated fatty alcohol ethoxylates, alkyl sulfonates, aryl sulfonates, alkyl sulfates, alkylsulfates, and combinations thereof, and

(b) a second component selected from the group consisting of cationic starches, non-ionic starches, anionic starches, water-soluble polymer, water, and mixtures thereof,

wherein the alkylene ketene dimer component is sufficiently dilute to enable the sizing composition to impart useful sizing properties to a fibrous substrate when the sizing composition contacts the fibrous substrate.